

# Glaciers can erode the landscape and they do a fabulous job

[http://www.youtube.com/watch?v=AG3luuhc-5Y&feature=player\\_embedded&list=PLxoGT-uqkSqWkosktGWW90Fb\\_dKDhBQtl](http://www.youtube.com/watch?v=AG3luuhc-5Y&feature=player_embedded&list=PLxoGT-uqkSqWkosktGWW90Fb_dKDhBQtl)

- Spectacular scenery
- **Two processes: glacial abrasion and plucking**
- Like water, it's capable of grinding away the rock that it travels over but also it can pluck away pieces of rock
- The top of the glacier is called **cirque**... where the snow is accumulated and started to take away some of the rock
- One-way is by grabbing the rock and by **PLUCKING** it and carrying it away
- The back of the cirque is going to be very very **steep**
- So much erosion will cause the back of the cirque to be very steep: that steep wall is called the **head wall**. It's so steep that it will start breaking apart and pieces of rock will fall down and the ice will carry them away.
- Now that it has all the sediments with it, it can start its **second method of erosion called ABRASION**
- **Striated rock ... scratches** and even **tell the direction of the ice flow**. These **scratches are called striations**
- They can even **polish the rock smooth**... smoothly polished granite that used to look rough.
- Circular areas located at the top of the glacial valley where the ice begins that sometimes have a **cirque lake or a tarn** in them. After the snow is all gone the depression is a great place to collect some water.
- Noticed the **valley shape, totally different from the river valley: U-shaped cross section** of the valley
- Glacial valleys can be easily distinguished from the river valleys; if you saw a valley like that ...it must have been a young river that carved the valley; for a valley like this **broad 2:55... roughly U-shaped valley ... that must have been an old river that ... down a flood plain and left .. plain valley**. But if you saw that glacial valley ... how steep the sides are, how deep it is....There may have a little river at the bottom but this tiny river didn't carve that valley: that's a misfit stream that's flowing in a valley that was cut long ago by ice
- Instead of just having one lake, there may be a whole series of lakes, like a series of beads, reminding of a rosary: **Paternoster lakes**... series of lakes in glacial valleys
- This glacial valley is hanging high above the main glacial trunk... deliver its ice to the top of the main glacial... they don't carve all the way down to meet the main valley the way a river does ... the way tributary valley joining the main glacial valley ... the main glacial valley is much deeper so when ice is gone this tributary valley hanging above
- **Fiords**, narrow valleys carved out by glaciers but that have since been invaded by the ocean. How is it we can have the ocean in a glacial valley? That doesn't make sense. Let's get a few clues to figure this out: this red line has rough rock above it and polished rock below. What polished that rock? Must have been ice. That indicates that these glaciers must have been much much larger in the past (**last ice age at its greatest about eleven thousand years ago**). During the ice age the sea level was much lower
- and in fact this wouldn't have been the sea level; but since then sea level is now all the way up these glacial fiords... Here's some more in Iceland... so every one of these bays is now at sea level but they were once filled with glaciers
- **Horns**. When a mountain is surrounded by cirques it ends up having very very steep sides and can often be turned into very distinctive sharp edges. This mountain is called a horn.
- **Aretes**; very very steep-sided ridges that are between glacial valleys. The glacier has eroded steeply on each side of it, leaving these sharp ridges behind
- So let's see what you've learned. What is this structure? It's called tarn lake but he it is of course a cirque lake
- Yosemite valley was a mystery to those two hundred fifty years ago. They thought it was the result of a giant earthquake tearing the earth apart... but it was John ... who had traveled up in Alaska ... and who came back to his beloved Yosemite valley and decided that it was formed by glaciers

## Glaciers and Glacial Landforms

[http://www.youtube.com/watch?v=SROTOaENeHs&list=PLxoGT-uqkSqWkosktGWW90Fb\\_dKDhBQtl&index=4&feature=plpp\\_video](http://www.youtube.com/watch?v=SROTOaENeHs&list=PLxoGT-uqkSqWkosktGWW90Fb_dKDhBQtl&index=4&feature=plpp_video)

**Active trunk glacier with its associated tributary glaciers:** there's more snow accumulation than melting so the glacier is growing

**Post glacial view:** when there is more melt and snow accumulation recedes; the landscape reflects the years of glacial erosion.

**Main glacier:** this is the largest flowing area of the glacier

**Medium moraine:** when a small tributary merges with the main trunk glacier, the debris on lateral moraines become lines of material carried along in the main glacier

**Truncated spurs:** a glacier will cut away layers of rock as it moves down the hill. Truncated spurs can be seen where hill sides are bisected by the glacier.

**Horn:** the peaks associated with glaciers horns are sharp after years of glacial erosion.

**Cirque:** at the peak of the mountain, the valley in the snow accumulation area of the glacier is hollowed-out by glaciers, producing a rounded circled valley

**Arete:** a sharp and nifelike divide of crest formed between two cirques by alpine glaciers

**Paternoster lakes:** these are a series of lakes strung together by a single stream. These occur when the glacier has receded and is created by terminal moraines.

**Hanging valley:** this valley is formed by a tributary that ends up a cliff above a larger track glacial valley

**Hanging waterfall:** it forms in a tributary hanging valley, falling into the valley formed by any the main trunk glacier

**U-shaped glacial troughs:** after the trunk and tributaries of the glacier recede, a U-shaped glacial troughs remains